Evaluation of the effects of rationally designed anti-TrkB peptides on the proliferation and apoptosis of multiple myeloma cells

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Abstract

Inhibition of oncogenes through use of small peptides has emerged as a new promising approach in cancer therapy. TrkB is a proto-oncogene that its up-regulation has frequently been reported in the Multiple Myeloma (MM) cells. In our previous study, we have designed two potent inhibitory peptides based on the TrkB structure. Here, we have evaluated the effects of these anti-TrkB peptides on the proliferation and apoptosis of MM cell lines. The 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) and flow cytometry were used to measure the cell viability and apoptosis of two MM cell lines treated with designed peptides. The effects of designed peptides on the expression and phosphorylation of TrkB were assessed using western blot assay. These designed peptides could efficiently modulate cell proliferation and apoptosis of MM cells through inhibiting TrkB phosphorylation. Our results indicate that the inhibitory anti-TrkB small peptides are very potent to inhibit MM cell proliferation through blocking TrkB signalling pathway.

Keywords: multiple myeloma cells, anti-TrkB peptides, TrkB phosphorylation, cell proliferation, cell apoptosis, bioinformatics, oncogenes, cancer therapy, proto-oncogene, oncogene inhibition, flow cytometry, cell viability, small peptides, signalling pathways